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MONTHLY REPORT OF THE OFFICES OF FOREST EXPERIMENT STATIONS AND DENDROLOGY

APR 1926

GOVERNMENT PRINTING OFFICE 9—5156

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FOREST EXPERIMENT STATIONS AND DENDROLOGY

April, 1926

FOREWORD

"The Staff of a Research Laboratory"
By C. K. Mees

(Continued from March Report)

In the organization of a laboratory it is essential to take into account the peculiarities of the individuals who compose it. Men are of very different types with regard to their ability to work together or their preference for working single-handed. Some men prefer to co-operate with others and to work in groups; others prefer to work almost entirely by themselves and on their own initiative, following up one line of work until they have solved all its problems for themselves. Some men prefer to have a number of assistants under their direction who will carry out instructions literally, so that the work of the whole group of men is based on the ideas and initiative of the senior man, while others again prefer to do the greater part of their work with their own hands and are not interested in directing the activities of younger men, preferring that any assistants should be capable of carrying on work more or less on their own initiative and without any explicit direction.

It is impossible to consider any rigid system of organization where men are of such different types and opinions. A departmental system in which the younger men are all directly responsible to senior men, who in their turn are responsible to the director, may be very satisfactory with some senior men and some junior men but will be unsatisfactory to the senior men who do not wish to direct the activity of others, and to those junior men whose temperaments are such that they feel continually hampered unless they are allowed to develop their own ideas.

On the other hand, a system of organization in which each man carries on a piece of work for himself may be very satisfactory to some men, but others of insufficient initiative may be unable to do any satisfactory work under such a system, although as assistants to other men who could supply the ideas they would prove excellent investigators.

For some reason or other it is generally considered that men who wish to work alone and carry out their own ideas are of a higher intellectual type than the organizer who prefers to carry on work which requires a great many hands to develop, but for which his own brain can do the thinking. The first type of man seems to have the public sympathy

to the highest degree; he is considered more original and of the more important type. This is probably a complete error; not only does the organizer who can organize more men produce the greater volume of work, but, also, he trains men and establishes a school for the whole product of which he is entitled to some degree of credit. Thus, on the one hand, we have such an investigator as Darwin, who, by reason of his physical limitations, necessarily worked alone, while on the other we have such a master teacher as Liebig, or, in more recent years, Fischer. Great as was Darwin's personal work, who can doubt that if Darwin had been able to carry out his work in connection with many other men not only would far more work have been done, but the school that he would have created would have promoted the progress of biology to an extent which no single man could hope to do.

In the organization, therefore, of a laboratory, provision should be made for men of different types, and while on the whole a departmental organization is desirable, and the heads of the departments must necessarily be responsible for the work of their departments, yet it should not be impossible for a young man who displays real originality to branch out into a research on his own account and of his own initiative.

On the other hand many of the younger assistants will want to fly before their wings are grown, and will feel capable of directing their own work long before they really have sufficient knowledge of the methods of research to do so economically, and it is necessary to repress such endeavors without crushing the initiative of the men themselves. A man must realize on entering research work that he must be prepared to work on the ideas of others for a number of years in order that he may obtain the knowledge necessary to arrange the exploitation of his own.

It is very important that each man should have proper credit given him for the work he does. In the publication of research the paper should be under the name of the man who initiated it unless another man did a large part of the experimental work, in which case both names should be put on the paper. Men are very jealous of credit for the work they do, and justly so, and this point must always be borne in mind when considering the question of publication. The publication of the scientific results obtained in a research laboratory is quite essential in order to maintain the interest of the laboratory staff in pure science. When the men come to a laboratory from the university they are generally very interested in the progress of pure science, but they rapidly become absorbed in the special problems presented to them, and without definite effort on the part of those responsible for the direction of the laboratory there is great danger that they will not keep in touch with the work that is being done by other workers in their own and allied fields. Their interest can be stimulated by journal meetings and scientific conferences, but the greatest stimulation is afforded by the publication in the usual scientific journals of the scientific results which they themselves obtain.

In scientific investigation a long time is often required before any results of value can be obtained. An investigator starting in a laboratory will usually take a considerable time before he has acquired sufficient knowledge of the special subject on which he is starting work to carry on his work effectively, unless that work is of a type identical with an investigation on which he has been engaged before entering the laboratory. There are two points which arise from this fact: In the first place, a man who has passed through the initial period and is actually engaged in effective research in the laboratory obviously represents a considerable investment, since he has been paid his salary during the initial period and has probably also spent a considerable amount of money in experimental work without obtaining very much in the way of returns. If men leave a laboratory, therefore, after training, they represent a considerable financial loss to the laboratory. This is the same problem as the turn-over of labor in a business organization, but with the difference that the training of scientific men is usually a far more costly matter than the training of even skilled labor in a factory. The other aspect of the matter is that a man is likely to become very much discouraged during this initial period. He comes to the laboratory full of enthusiasm and anxious to make a success of his work, and at the end of eighteen months he finds himself without anything to show for his pains - often without even the outline of a scientific paper - and he is much tempted either to change and try his luck elsewhere or to turn to some minor piece of work which promises an immediate return instead of carrying out the more difficult work for which he has been preparing. Some of the most important researches require many years of work before they give any results of value, and it is difficult during this period to prevent both the research workers themselves and those responsible for the management and direction of the work from becoming disheartened and abandoning the work in a half completed condition. Patience and willingness to wait for results are essential both on the part of the investigators and on the part of those in whose hands lies the direction of the laboratory.

In connection with the discussion of the organization of research which has been carried on in the last few years there have not been wanting signs that many research workers are dissatisfied with the conditions attaching to their profession, and while the standing of scneitific men is rapidly improving, it certainly cannot as yet be considered to be altogether satisfactory.

Hitherto, a man who has chosen to become a scientific investigator by profession has been expected to be prepared to sacrifice in the interest of his scientific work a certain amount of material prosperity as compared with that which he would probably be able to attain if he entered such other professions as the law, medicine or engineering. The teacher is notoriously underpaid, although he obtains some compensation for this in that he has a larger amount of leisure time than falls to the lot of most other men, but the research worker rarely is able to take much relaxation from his work, and his payment until recently was calculated on the lowest possible scale.

With the increasing number of laboratories the competition for capable workers is producing a considerable increase in their remuneration, and it is not too much to expect that before long scientific research will be a well paid profession which will be attradtive even to these who esteem financial rewards above all other considerations. It may be thought that such considerations will not produce first-class investigators, and undoubtedly a man who is attracted to research for money is unlikely to possess the necessary temperament for success, but the great financial prizes offered to first-class surgeons, lawyers, and engineers have not prevented their development even if they have not stimulated it.

To a certain extent the salaries paid for industrial research will be kept down by the competition of the very badly paid scientific men of the universities, but eventually the demand for research men will result in the universities losing at once all those men who are capable of work in applied science unless they meet the competition by raising their standard of payment very greatly.

FOREST EXPERIMENT STATIONS

Washington

General

It will be a source of regret to all those who knew Mr. Sudworth to learn that he fell recently and broke a couple of ribs. At the present time he is getting along as nicely as can be expected under the circumstances, but still is having a hard time of it. Just when he will be able to return to the office is unknown. He is still suffering and the bones seem to be having difficulty in knitting properly.

The office in Washington is now very much disrupted. Following the enlargement of the Branch of Public Relations a general reorganization of the space in the Atlantic Building was necessary. Research, which formerly was on floors two, three, four, five, six, and seven, is now to be concentrated chiefly on the sixth floor. The library remains on the second where it is now, Research has two dark storerooms on the third, the Section of Forest Measurements now has the entire front of the fourth floor, while the rest of the Branch has found quarters on the sixth. The present move is the biggest shake-up in the Washington organization for a good many years.

Legislation

Congress remains in session and during the month has had placed before it one new bill by Representative Aswell of Louisiana which provides $85,000 for the purchase of a tract of virgin hardwoods of 375 acres in Louisiana, known as Bynum Woods. The woods are to be retained as a combined National Park and forest experiment station. The bill in

part resembles very much the Edwards' bill for the purchase of some land in Georgia for the same purpose on the site of what is known as the "Old Stockade."

A hearing of the Senate Committee on Agriculture was held on Senator Reed's bill, Senate 2576, for a Pennsylvania Station, and the bill was reported favorably to the Senate with an initial authorization of $30,000.

Both the Senate and House have now acted upon the Department of Agriculture Supply bill, and it has now gone to the President for signature. (Signed May 11). Final action of both Houses retained an item for the Appalachian Forest Experiment Station and provide also for the establishment of a forest experiment station in California.

A scheduled hearing for the Fitzgerald bill for an Ohio-Mississippi Valley Station before the House Committee was not pulled off and neither was a scheduled hearing for Representative Davila's bill for the tropical station.

Visitors

Among the visitors in Washington during the month were Mitchell, of the Lake States, and Frothingham of the Appalachian. Mitchell completed his work on the fire study, using the machine tabulator, and remained in Washington for about three weeks assisting in the general conduct of the office. This assignment was of very material assistance in handling the regular work and in helping reduce the mass of accumulated material on which previous action had not been possible.

Frothingham came to Washington for a few days to discuss the plans for the expansion of his work. His enlarged program was agreed upon, and plans made for increasing the personnel. The Appalachian now will be able to carry on much work that it has been unable to handle in the past. Frothingham's program remains practically the same as it has been previously. This will permit the completion of a number of projects and reports.

Details

Reineke left Washington the middle of April for a trip to the Appalachian and the Southern Stations. He plans on helping out with the mensurational work at both stations and then joining the Southern Station in the survey of turpentine areas in the eastern coastal plain. He plans to return to Washington about June 1.

Meetings

Toward the end of the month the Advisory Committee of the Pulp and Paper industry held their second meeting, with representatives of the Forest Products Laboratory and the Washington office in attendance.

Eight (of 11) members of the committee were present and a most interesting meeting was held. It was apparent from the discussion that the pulp indistry has been putting into effect in the woods many of the practices the experiment stations have been developing and that forestry has gone a long ways with the industry. The committee was interested in the completion of the Department plan for the establishment of regional forest experiment stations. It also pointed out the need for much greater information on growth and yield studies for the important forest tree species. One criticism made of the experiment stations was that results from station work were not given out as rapidly as they might be, the committee apparently believing that there was a hungry and waiting world anxious to get the pearls of wisdom as they are formulated at the stations.

Previous to this, the National Committee on Lumber Standards met and one of the things considered was the need of a standard log rule. The subcommittee which handled the matter went in favor of a uniform scale and discussed the possibility of adopting the cubic foot rule. While the final committee report has not yet been issued, it is believed that the matter will be put up to the Forest Service for a recommendation as to the possible rules for consideration by the major committee at the time of its next annual meeting.

Library

There were 939 books and periodicals loaned in April, and 138 members of the Service and others consulted the library in person. During the month the librarian indexed 308 books and periodical articles.

"CLEAR, EFFECTIVE WRITING"

If the quality of mercilessness is not strained, in the author towards his product, he will learn to write, or so we dared to prophesy last month. But what shall be the quality of this mercilessness, and how shall it most effectively operate? I am going to hazard a recipe for merciless authorship, one that is borrowed in part from a delightful and stimulating talk by Dr. E. W. Allen of the Office of Agricultural Experiment Stations.

Dr. Allen gave three notable examples of the care with which good writers revise their manuscripts. He told of Sir T. Clifford Allbutt, who made four drafts of a manuscript before he considered it ready for the printer; of Sir William Osler, who had a fixed and thorough program for the preparation of his writings; and of Anatole France, who went six separate times over his finished work to clarify its meaning and improve its style. I have compounded from the procedure of all three of these men and my own experience a recipe for good scientific writing. It comprises a good many separate steps in composition and revision. If you want to make your next manuscript editor-proof, however, this is one way to do it.

1. Study notes and data painstakingly before writing anything. See whether, finally, you can state in one sentence what you mean to say about them, or to have them show.

2. Arrange your material in logical form, considering what tables may be necessary and what data can be omitted.

3. Make a rough outline in longhand. See whether it is any easier now to state in one sentence the main purport of your work. Test outline for logical order. How does it differ from the previous arrangement of data, and why?

4. Make a more complete outline, if possible getting down to minute details of the proposed discussion. Get this outline typed and find out one or two of the major things that are wrong with it. Revise it thoroughly. Cull unnecessary items.

5. Put aside the outline, or refer to it only occasionally, and work out a rough draft of your manuscript. Read through a typed copy of this and see what is the matter with it. Correct it. Does it agree with your outline? If it differs considerably, make an outline of the rough draft and compare it with the outline made up from the notes and data. Which is better, in each detail? Revise rough draft accordingly.

6. Make a neat copy, running no paragraphs over pages and leaving plenty of space for corrections. Read through this for general structure of whole paper; aptness and proper subordination of titles; size and unity of paragraphs; phrases, clauses, sentences, and paragraphs that, because of previous transpositions and other changes, do not now carry full or any meaning, or need to be related more definitely to the general context.

7. Make a second neat copy and if possible leave alone for two weeks or more. Later go through this draft to recast sentences and paragraphs so that they will carry out your meaning and bear only one interpretation, with particular attention to the choice of words suitable to the audience you are addressing. Lay the manuscript aside for another two weeks or more.

8. Go over the entire manuscript again for final revision or additions, as though to put it in final form for the printer. Have a third neat copy made, paged, like the last, by paragraphs.

9. Go over the entire manuscript carefully with the sole purpose of testing each paragraph to see whether it is a unit of thought properly related to the preceding and following paragraphs, and whether it can be brought down to contain not more than five sentences of ordinary length or three longer sentences.

10. Go over the entire manuscript carefully with the sole purpose of straightening out and, if possible, shortening sentences. Be sure the words that go together in the sentence are together. Get the prepositional phrases and the adverbs in the right order and relation to convey smoothly just what you mean. Are the emphatic words at the beginning or end of the sentence, and if not, is there a good reason why not? Test every sentence in this way. Retype such pages as have been corrected and lay the manuscript aside for at least two weeks.

11. Go over the entire manuscript carefully with the sole purpose of striking out every unnecessary word and phrase and of substituting short and familiar words for long and unfamiliar words wherever possible.

12. Read through the manuscript with the sole purpose of detecting weak spots of any kind. See that these questions are answered all the way through:

Are all the statements consistent? Are they all thoroughly justified, or are they perhaps attempts to prove the point by assertion? Is what you say about any item in the tables or charts really so? Are you sure there is no real or seeming inconsistency between text, tables, and charts? Have you given due credit to the other fellow? Have you looked up statements of fact, quotations, and citations, and are they correct as given? Have you dragged in any data or conclusions that are irrelevant or not entirely pertinent? Is your introduction more than a dull apology for the manuscript; or will the reader's eye brighten with interest as he reads it, supposing only that your subject would normally appeal to him? Are your concluding pages more than a scanty rehashing and repetition of what you have already said? Is it not possible, by emphasizing the major conclusion of your study, to present whatever summary is needed in a more palatable and convincing form? Looking through the table of contents, which is presumably arranged to show headings and subheadings in their proper relationship, do you find that the arrangement by and large is logical; that is, does it proceed from the general to the particular, from cause to effect, from primary to secondary; and if not, is there a good reason why not?

Having followed this recipe with intelligence you have the manuscript proper in good shape. There is more to be done, with the illustrations and charts. This can be explained next month.

At this point, however, a little comic relief may not be amiss. Let us consider a few examples of attempts at "clear, effective writing" as culled from examination papers on forestry written by technically trained foresters.

For example, one who had wrestled perhaps somewhat despairingly with the subject of sustained yield achieved this triumphant statement:

"Therefore it is seen that these concerns can be based and plan the future work on a 60 years supply giving the reforesting area a

chance to grow it will in turn allow the future of the area to be cut over. Therefore perpetuating the supply of timber in and adjacent to them. Profiting by the lesson taught by our early mistakes in the present field of forestry."

Another, who evidently had no more illusions about the matter, remarked: "I measured 5 burnt-over area trees but they were typical with bark on both sides."

One who would be perfectly candid with the examiner stated: "Procedure:--The first thing I did was to make a bark gage. The next thing I did was to make a 7 foot ladder to take the ten foot measurements. The other equipment I took was a pair of calipers and a wrist compass. Both sides of the tree were measured to take diameters."

An equally candid graduate declared: "My general conclusions are at the end of the report. My individual conclusions are found under the tables."

"I climbed the tree," said one embryo forester, "and made a boring with a diameter measurement for half the height of the stand." "The value of this method," remarked another, rather as if referring to this particular procedure, "the value of this method, if feasible, should be useful." It should, indeed!

"You recognize site in Oregon," stated one enthusiastic Oregoner who had evidently been out in the woods, "by whether there are trees growing on it. If there are trees, its a good site." Something like this was in the mind of another victim, who declared: "Site is part of an area that renders it susceptible to tree growth." Another, who would not hazard quite so broad a statement, stated that "a site is a place where something is." "The site factors," remarked still another, confidently, "are I, II, III." Possibly the examiner, who played umpire in his one-o'-cat days, muttered at this point: "He's out!"

Lastly, I wish this excerpt were not quite so reminiscent of some paragraphs that have come across the editor's desk in the guise of finished work:

"The timber supply in this watershed will last at present rate of cutting, 61.8 years including the land to the north but which is adjacent to them if not cut before then."

SOUTHWESTERN FOREST EXPERIMENT STATION (March and April)

A report on a study of relative diameter growth before and after cutting was revised during the month. This report will probably be submitted under the joint authorship of G. A. Pearson and A. D. Follweiler.

The old manuscript on forest types was worked over and some of the data corrected. This manuscript is still not ready for publication.

Krauch examined the Fort Bayard plantations during the latter part of the month. The flats on good or fair sites are holding up well, but on the poorest sites they are on the down grade.

Pearson began a series of weekly lectures on general forestry at the Flagstaff Teachers College, given in connection with a course in nature study. The class has an enrollment of 25.

The month of April has been characterized by unusually heavy rainfall throughout Arizona and New Mexico. At the Southwestern Forest Experiment Station the total precipitation for the month was 4.59 inches, which is 3.36 inches above normal. In the desert regions around Tucson and Roosevelt, precipitation was plentiful all through the winter, with the result that vegetation, particularly annuals, have made phenomenal growth. Rains on the Salt River and Tonto watersheds in April raised the water level in the Roosevelt reservoir from about 110 to 165 feet adding over 400,000 acre feet of water.

Pearson spent the first half of the month in Southern Arizona. At the request of the Phoenix Chamber of Commerce, a few yellow pine, blue spruce and Arizona cypress were planted in Phoenix. On April 7, he addressed the Tucson Natural History Society on "The Great Pine Forest of the Southwest." Two days were spent on the Santa Rita Range Reserve. Fenced plots here show wonderful possibilities in the establishment of natural cover by control of grazing. Five days were spent in the Dragoon and Chiricahua mountains. In the latter, the writer made his first acquaintance with Apache pine. Judging by its habit of growth and the reputed high quality of its wood, this tree should be considered in future reforestation programs. It occurs at slightly lower altitudes than Pinus scopulorum and Pinus arizonica and it appears to grow more rapidly and to clear itself better than these species. Examination of cypress in both the Dragoon and the Chiricahuas left some uncertainty as to whether the trees occurring here are Cupressus arizonica or Cupressus glabra, and again raised the question as to whether we really have two species of cypress in the Southwest. Judging by the number and size of stumps, cypress must have formed respectable stands in these mountains at one time.

American Forest Week was observed by good forestry programs at the Flagstaff Rotary Club and Hiram Club. Pearson was chairman of the day at the former, and Assistant Supervisor Kirby at the latter. In addition, Kirby addressed the student bodies of the Teachers College and the high school, while Pearson talked to classes at the Teachers College and the Emerson Grade School, and also supervised the planting of shade trees by several Flagstaff residents.

Elias Arocha, a student detailed to this station by the Mexican government to study forestry, arrived April 19. He is seriously handicapped by not knowing the English language.

Pearson and Cooperrider devoted a week in the latter part of the month to a study of the smelter smoke problem in the Verde Valley accompanied by Supervisors Miller of the Coconino and Wales of the Prescott. Thus far, no important timber values appear to be threatened because only small scattered bodies of sawtimber occur within the heavy damage zone. It is possible, however, that the damage may spread to the yellow pine on neighboring mountains and plateaus. It is purposed to keep a close watch on this by tagging trees in various places and noting evidences of damage from year to year. Pinons appear to be very susceptible. Shrubs, of which there are many species, are injured in various degrees but apparently only a few species are in danger of being killed. Grasses show very great resistance. As far as Forest Service lands are concerned, the greatest resource endangered at the present time is the watershed. Present indications are that a good grass cover and probably also a brush cover can be maintained by adequate control of grazing. In the past, more damage has been done to the ground cover by overgrazing than by smelter smoke.

NORTHERN ROCKY MOUNTAIN FOREST EXPERIMENT STATION

Two members of the staff are now on the sick list. On April 16 Weidman had an appendicitis operation and will probably be absent from the office for about three weeks. Marshall is to have an operation for ulcer of the stomach, and because this will lay him up for two months or more, he has decided to return to his home in New York City about May 3 for the purpose.

Together with Mr. Morrell, Gisborne attended the Portland conference between officials of the Weather Bureau and the lumber and forestry interests. In most respects the decisions reached at this meeting are entirely satisfactory to District 1. From a research standpoint, we agree strongly with Mr. Munger's distinctions between Weather Bureau and Forest Service investigations. With a meteorologist permanently assigned to the weather problems of this region, we now can turn over to the Bureau several phases of our fire weather research and devote that much more time to the weather-inflammability relations. It is hoped that the men chosen by the Bureau for this new work will be well trained and experienced meteorologists.

On his return from Portland, Gisborne installed the array of instruments used at Priest River for measuring the various factors of fire danger. Installation was none too soon, as fires have been spreading dangerously during the last few days.

The 1924 and 1925 summaries of lightning storms have been received and a report will be ready for field distribution before May 15. The great value of using the punch card system in sorting such material is apparent already, even though less than one-fourth the interesting facts have been brought out as yet.

Aside from general care of nursery seedbeds, good progress was made during April on the work planned for this spring by forestation research. For the so-called field survival project, 3,900 trees were planted. Of these, 1,800 1-2 western yellow pines were planted in three lots in order to test the effect of Ceanothus brush on the survival and later growth of trees. Nine hundred 2-2 western white pines were similarly planted to test the effect of willow brush in plantations. Twelve hundred 1-2 western yellow pines, divided into six lots, were given different top or root treatments and planted for comparisons of drought hardiness. In the root control project, which is merely one phase of the "survival" project, about 4,500 1-0 western yellow pines were transplanted in the nursery. These trees were divided into four lots receiving different treatment in respect to the severity of root pruning and depth of setting.

Specimens of our 7-0 Picea orientalis were sent to Wind River on March 30 and the remaining stock, about 575 trees, were shipped to Priest River on April 24.

This month Haig completed the first phase of the volume table study. The object of this work is to determine for western white pine the effect on tree volume of such factors as site, age, locality, density, and composition. The coded data ready for card punching were sent to Washington near the end of the month. About 800 punch cards will be used in sorting and tabulating this material. The preparation of these data at this time was only possible due to cooperation from the District in furnishing the services of several office assistants. Ranger Regnes, who has been on detail here since early February, returned to Hamilton on the tenth. But Ranger Yochelson has been able to give about half-time assistance for the entire month.

The check of existing volume tables was continued. McArdle, of the Pacific Northwest Station, stopped over in Missoula for two days to discuss volume, growth, yield, and fire studies.

Marshall spent the greater part of April at the Priest River Branch Station supervising the planting of part of the Fox Creek burn. About 59 acres were planted with 57,000 1-2 yellow pines, the spacing varying from 6x6 to 8x8. Sophomores from the Idaho Forest School were employed as planters for five days at regular wages to give them some practical and profitable experience in this work. The remainder of the planting was done by common laborers. Due to the fact that two separate crews were broken in, the costs ran slightly higher than usual, averaging about $16 per acre.

Kempff spent the full month as assistant to Mr. W. W. White who was in charge of the ranger school at the Priest River Branch Station. Although this cut into Kempff's regular work, it was an invaluable opportunity to give Forest Service men a bird's-eye view of the various silvicultural and other experiments conducted at Priest River. Mr. White reports that the equipment, material, and location there are ideal for the school.

April Activities

Roeser spent the first few days of the month in preparing a summary of the regional evaporation data which have been obtained with Forest Service evaporimeters. An outline of the season's work at the station was also made. Otherwise he was largely engaged up to the 19th on a general spruce volume table to be expressed in cubic feet. Old records dating back to 1906 were recently obtained from the District office and the inclusion of these will delay for some time the completion of the tabulations.

Since the 19th Roeser has been busy at the Fremont Laboratory testing evaporimeters, preparing yellow pine seed for sowing in a test of sources on the Nebraska and other miscellaneous spring activities.

Bates has spent almost the entire month on (T-5) soils data and has this project just about whipped into shape. The data so far obtained are not of a great deal of value except to show the extent to which variations in growth may result from soil differences. The almost total lack of chemical analyses of either soils or plants leaves us without scientific explanation of many of the interesting phenomena. However, the way is now made clear for a comprehensive series of tests which, in Bates' opinion, should take precedence over all other station work for the next two years. A comprehensive plan is in preparation. And, as though in answer to a prayer for a chemist to make this experiment what it should be, comes an offer of cooperation from an outside source. This will be fully reported when its possibilities have been established.

There were many interruptions to this work during the month, particularly those necessary to preparations for American Forest Week. In cooperation with Supervisor Hamel the Colorado Mountain Club and the Pikes Peak Game, Fish and Forest Protective Association were both interested in getting out printed matter calling attention to the Week. Many other local activities were induced, including numerous school talks on Arbor Day.

May Plans

Bates will attend the Madison Laboratory program conference from the 1st until about the 10th. On the 16th he will assist in "educating" the Denver and Pikes Peak groups of the Colorado Mountain Club at the Pike planting camp and Monument Nursery. Immediately thereafter he will leave for a week's trip on the Cochetopa, where he and Junior Forester Johnson will outline in detail the experimental work which the local force will be able to undertake at the lodgepole center during the next two or three years, it not being the intention of Research to attempt to concentrate on this area before 1929. The last few days of the month will probably be spent at the Laboratory making preparations for an extended absence. Roeser will be engaged during the entire month with a small amount of planting of breeding stock, with flower-formation studies and the other activities which characterize the usual spring work.

One of the outstanding events of April was the fire weather warning conference, called by the Weather Bureau in Portland and largely attended by Weather Bureau officials and forest protection men from the five western States. Prof. Marvin, Chief of the Weather Bureau, presided. This Experiment Station was represented by McArdle, Simson and Munger, and Miss Wertz took down the proceedings and wrote them up afterward. The day after the meeting 15 of the conferees, including the six meteorologists, made a trip to Wind River and spent the night there. All were much interested in the various Forest Service activities, and there was good opportunity to discuss informally fire studies and the relation of meteorology and forestry. In the evening all the company gathered around the office fireplace and listened to informal talk and discussion. Prof. Marvin spoke on solar radiation as it affects climate, sun spots and periodicities, and Dr. Dennison of the Dominion Meteorological Service gave an interesting account of his work in seismology.

Prof. Irving Bailey of the Bussey Institute spent a day at the office and later with the Director went up to Wind River for a day and a night. His trip is a part of the survey of forest research and education being made by the National Academy of Sciences under the auspices of the General Educational Board. Among other out-of-town callers during the month were R. B. Allen, Sec.-Mgr. of the West Coast Lbr. Mfgrs. Association, Assistant District Forester Morse and Supervisor Mains of D-4, and Assistant District Forester Heintzleman of D-8.

Munger has spent much time during the month reviewing manuscripts, both those originating at the station and in the District Office, and in attending informal conferences of one kind and another. During American Forest Week he gave a talk at the Sorosis Club luncheon.

Early in the month the Douglas fir yield study computations were sufficiently completed to enable McArdle to leave Washington. A few of the minor tables are yet to be checked, and stand tables prepared, but two months more should see this project completed. On the trip West McArdle called at Ann Arbor, St. Paul and Missoula, showing the new methods of yield and volume table construction to forest school faculties and Experiment Station members. A short account by him of the yield study with a few tables will appear in the May 1 issue of the West Coast Lumberman. The last week of the month McArdle was at the Wind River Station familiarizing himself with the various experiments under way there and in talking over fire studies with Simson.

Simson has been getting activities at the Wind River Branch under way all the month. Midsummer conditions have prevailed most of the time; the temperature reached 93°-12° higher than any previous April in 15 years of record. Our annual April "fire weather" period has spread itself over much of the month with days of 10 and 12 per cent humidity, and two very active Class C fires developed in the Wind River Valley which Simson covered.

The possibility of a plus error in precipitation measurements with Osborne rain gauges, due to the thickness of the measuring stick, has been suggested several times. Measurement of the actual displacement of water by the measuring stick was made by means of a micrometer hook gauge. The gauge was set up on the Osborne tube and the height of the water was read; the measuring stick was then placed in the water and the new water level read. The results are tabulated below:

Inches Precipitation	With Stick in Tube Becomes
.10	.1009
.20	.2032
.30	.3054
.40	.4077
.50	.5099

For precipitations of three to five tenths inches the displacement becomes appreciable.

Westveld spent practically the entire month in eastern Washington, traveling in the Ford from one lumbering operation to another, visiting fourteen cut-over tracts both on and off the National Forests, getting acquainted with the local brush disposal practices and problems and picking out areas for intensive study later. Rough topography, erosion, scrubby timber and insects in this region give the brush disposal problem some new angles it does not have in Oregon.

Isaac spent the first three weeks of the month preparing progress reports on several projects. On March 20, 1926, when the seed containers were lifted for the annual germination test, it was surprising to note that a large number of the seeds had started germinating, including some that had been buried 2 inches deep. Some seeds were just cracking open while others already had a quarter-inch long radicle. It was generally supposed that the start of germination was several weeks later.

The snag survey covering stands up to 325 years old indicated a wide range of conditions with no direct relation between the size and number of snags and the age of the stand. The study did, however, indicate a change in the type of snag at maturity. In the younger stands the snags usually come from the smallest trees that are choked out by suppression, while after maturity the trees that become snags are often the oldest and largest in the stand.

The last week in April Isaac spent making periodic examinations of seed tree survival areas and germination and survival plots at West Fir, Oregon.

A compilation shows the following time in the field last calendar year:

Munger	95 days	
McArdle	144 "	(including a half month in Washington, D. C.)
Isaac	166 "	(includes over 2 months while stationed at Wind River)
Westveld	121 "	(since July 1)
Simeon	33 "	(includes time away from Wind River headquarters but not winter detail in Portland)

The average daily subsistence charge while on expenses runs for individuals as follows: $2.11, $2.38, $2.63, $2.75 and $3.77.

NORTHEASTERN FOREST EXPERIMENT STATION

Mr. Dana left early in the month to attend the World's Forestry Congress at Rome, after working night and day to complete the report on "Timber Growing and Logging Practice in the Northeast."

Behre completed the checks on the form class volume tables used in Meyer's yield table study. The check on the aggregate volume of the three to four hundred trees tested in red and white spruce was around 1½ per cent, and for balsam about ½ per cent; while in all species the average deviation of the individual trees was only between 4 and 5 per cent. Behre also did some work on the proposed modification of form classification which puts this on the basis of the entire stem rather than the portion above breast height and results in considerable improvement and simplification of the technique in several respects. If further study discloses no defects or drawbacks to this system, the new classification will doubtless prove a desirable substitute for the usual form quotient.

Westveld worked continuously on the report which he will soon have ready for publication on reproduction of spruce and fir.

Meyer has been working up some final figures and preparing the manuscript report on his yield study in order that this project may be well rounded up prior to his departure in June.

Stickel spent a good share of his time assembling the instruments and making other necessary preparations for field work in connection with the studies of fire weather conditions. Some of his time was devoted to helping Meyer prepare the charts which will accompany the yield report.

Spaulding completed his manuscript on White Pine Blister Rust in Europe, and continued his work on the study of records on wood-rotting fungi of the Northeastern States.

MacAloney got the field work in connection with his white pine weevil studies under way at Petersham, Mass.

G. E. Sargent from the University of Minnesota, and G. W. Dean from the State Forest School at Mont Alto, Penn., reported for duty as under scientific helpers early in the month, and Kathryn E. O'Neill took Miss McGowan's place on the clerical force.

General

Mr. Zimmerli spent ten days with us, making a thoroughgoing check of our accounts for the past two years, and suggesting improved methods of bookkeeping. He also examined our property records and the property itself, and went over the library, and in fact everything connected with the administrative office work. He had no serious criticisms of our methods but was able to give us many valuable suggestions based on his long experience with Service accounts and administrative routine.

Forbes had a most interesting and fruitful trip to the Florida and Benning National Forests. On the Florida he joined a party consisting of the Assistant Forester, District Forester Kelley, Assistant District Forester Evans, and Supervisor Hill. Thanks to the District Rangers this party saw a very large portion of the Forest in a few days. We were unanimous in feeling that the silvicultural problems of the Choctawhatchee are extremely serious and that there is need for thoroughgoing and sustained research in this region of deep sands. Forbes found the keen appreciation by the Washington men of the value of research particularly gratifying, and anticipates hearty cooperation from the District in time to come. The work we have already done on the Florida has given us some idea of the job ahead of us, and we are very seriously considering recommending the Choctawhatchee as a Branch Station. Mr. Sherman and Forbes went on to the Benning, where we met the newly arrived Supervisor, and District Ranger John Byrne. Although we may not establish a Branch Station at Columbus, we are certain that some work should be done there and that in it we will have the hearty support of the local officers. We found opportunities to do thinning work in longleaf pine, for which we have long been looking. There are also opportunities for studies of methods of cutting in both longleaf and loblolly pine. From Columbus Forbes went on to Gordon, Ga., and Atlanta. At Gordon he found Mr. M. T. Nichols of our Advisory Council cutting pine pulpwood with an eye to continuous operation of his mill, and planning a program of acquiring whatever acreage is necessary to keep the plant running indefinitely. In Atlanta Forbes called on Mr. J. N. Harper, also of the Advisory Council, who described his tour of the Belgian forests last fall in company with the Chief Forester of Belgium. President Cox of Emory University, on whom Forbes called, wanted to know how to raise trees on some 1,200 acres of worn-out plantations in middle Georgia which he has just bought. This is just another instance of the universal interest in forestry which we find among the thoughtful people in the South today.

Forbes and Demmon made a flying trip to Baton Rouge on the day of the dedication of the new campus of the State University. In spite of the serious illness of Prof. Lee, the Louisiana Forest School is going ahead and is now in the field for an additional teacher, at a substantial salary. The seed testing work being done in cooperation with us, and the school's own nursery, were examined.

Wyman spent an interesting week with Dr. Cary, in a survey of timber on certain islands off the coast of Georgia. The Navy Department is looking for live oak knees with which to repair the historic frigate "Constitution." Wyman thus describes conditions on Grover's Island: "This Island has not been burned for 35 years and shows the results in a continued excellent growth of middle-aged timber. Pines reached 38 in. d.b.h. and 110 ft. tall. Magnolia and hickory were 36 in. d.b.h. with 30 to 36 ft. clear length. Occasional live oaks were 40 inches and some had 16-18 ft. clear length. Many knees were available. One result of no fires has been the thickest tangle of shrubs, vines, and palmetto I have ever seen, making it impossible to run over 1½ miles of chain wide tally strips daily. Leaf litter did not exceed 6 in. in depth." Dr. Nelson of the Biological Survey accompanied the party to certain of the Islands.

Wyman, a Director of the ambitious Florida Forestry and Beautification Society, regretfully reports the demise of that institution, owing to the failure of the "unknown philanthropist" who founded it to continue his donations.

Protection, Fire

A project long contemplated was established on the Cherokee State Forest in Texas. Demmon, with the help of Wakeley, and the cooperation of several members of the Texas Forestry Department, established five plots in shortleaf pine for a study of fire damage. These plots are departures in two respects from past practice and we expect much from them. In the first place, each plot was five acres in extent, which will permit the kindling of a very much more typical fire than is possible in our 1/4 acre or smaller plots in longleaf and loblolly pine elsewhere; the area under actual observation in each plot is only one acre with a still smaller quadrat for the observation of seedlings. In the second place, these plots are not in an uneven-aged stand but one containing everything from seedlings up to trees 16 inches in diameter. Shortleaf pine occurs typically in all-aged stands and this single series of plots will fulfill the same purpose as several series in even-aged stands each of a different age. Demmon on his way back from Texas attempted to burn the spring-burned plots at Urania but found them too wet. He brought the unwelcome news that 600 acres in the Greeley Pasture at Urania had earlier burned over in a fire set within the pasture by rabbit hunters. This February fire not only burned through our plantations, which after all had about fulfilled their usefulness, but hardly improved a set of plots for the study of natural reproduction of shortleaf pine. The fire was vigorously fought, once discovered, but a very high wind made control difficult, it got out again the second day.

Demmon, with Hine's help, has prepared a record sheet to be filled out whenever the seasonal burn is made in one of our permanent fire plots; he also made considerable progress in an article on fire damage to virgin pine. Data for this article were obtained from our extensive surveys.

Measurements

Hadley spent about two-thirds of the month in what we trust will be the final revision of his tupelo manuscript, Forbes also contributing some time in review. Forbes could squeeze in but two or three days on his Pine Bulletin. Demmon's analyses of the data so far obtained on the rate of growth up the stem of trees released by cutting convinced him that further field work must be done, and that the picking up of a few trees here and there as the crews happen to come to them in the course of the extensive surveys will not do. Demmon outlined a more thoroughgoing study which we hope to undertake at Urania before long.

Management

We took advantage of the Yale Forest School's offer of cooperation at Urania, in the matter of type-mapping the Greeley Pasture. Demmon reports that the following types, which have been worked out in the South by the previous Yale classes will be recognized in this job: I. Original forest types - longleaf; mixed pine and hardwoods; old field; bottomland hardwoods; shortleaf hills; farm, pasture, and so forth. II. Present stand - virgin; culled; seed trees (at least two pines per acre); clear cut (no seed trees); cultivated; grass, pasture, and so forth; III. Reproduction - pine A (over 50 per cent); pine B (15 - 50 per cent); less than 15 per cent pine, merchantable hardwoods; less than 15 per cent pine, scrub hardwoods.

Wakeley spent several days mapping the seed trees in the Tate Lease at McNeill. This job will take advantage of the unusual opportunity to obtain data on the establishment of longleaf pine seedlings under a wide variety of cover conditions, and at the same time will furnish data for an excellent study of accelerated growth following a cutting some 20 years ago.

Naval Stores

In Wyman's absence on his trip with Dr. Cary, Student Assistants MacKinney and Barnes have been carrying on the routine work on old tests at Starke, and have made progress on the establishment of additional work in the tract near Kingsley Lake. Work in the Johns' Tract, which included our climatic tests of last year, had to be abandoned, because of the failure of the operator and the owner of the timber to get together on a price this year. This has seriously delayed the start of the new climatic tests as well. We are furnishing Miss Gerry with chips from a large number of matched trees which show wide and apparently inexplicable variations in gum flow.

Forestation

This is our busy season in the nursery, and we have employed two students from the Forest School at Baton Rouge. The last of the Jacobsen germinator tests were installed, and the sand flat tests have required

daily counts. In addition to the seed testing and our regular nursery projects, Wakeley carried out plans for reexamining our considerable plantations. Chapman registers an extraordinary complaint anent our very early plantations at McNeill; the planting site has become so thoroughly stocked with natural reproduction that reliable counts are no longer possible! The same was just about true of our Urania plantations before the fire got them.

Wakeley and Chapman wrote a brief article describing a device used for seeding sand flats, and Chapman has been working out a key for seedling identification in the nursery.

Protection, others

Hadley has kept Miss Regan busy most of the month on revision of the quadrat maps in the Tate Lease, using data from his March field work. The last ten days of the month Hadley has put in on the preliminaries of a progress report in the grazing project, with particular emphasis on the establishment of reproduction from the 1924 seed crop.

Agronomist H. R. Reed of the Coastal Plain Station has installed soil thermometers in each of the four conditions represented by the McNeill Pasture; burned and ungrazed, burned and grazed, unburned and grazed, unburned and ungrazed.

An unusual amount of a fungus, previously identified as Peridermium fusiforme, was reported to us on loblolly pine in Southern Alabama, and the matter was referred to the Bureau of Plant Industry.

CALIFORNIA DISTRICT FOREST EXPERIMENT STATION

The field measurements of the entire series of cutting plots for the third 5-year period have been completed.

The Shasta plots represent a very poor site quality and the succession of dry years has intensified the damage from mistletoe and insects. A large number of Douglas firs which had resisted mistletoe infestation for many years were found to have succumbed. A very high percentage of the white fir has been killed by the engraver beetle (Scolytus subscaber). The plots represent about the limit of existence for white fir and the drought apparently turned the balance in favor of the beetles. Dendroctonus likewise seized the opportunity to mop up on several doddering yellow pines. The compilation work in this study still occupies most of the office time.

The Mexican forester, Cenobio Blanco, assisted in the work on the Shasta. Senor Blanco is spending a few weeks in San Francisco acquiring a better working knowledge of English. He spends the mornings in the District Office studying our methods and assisting in Research. Later he will go to the Sierra for first-hand knowledge of administration, etc.

Because of continued requests from other agencies and for our own use, the District instructions for the establishment of methods of cutting plots was revised and additional copies made.

Two seed-beds were sown to western yellow pine at Feather River the middle of April to provide a small amount of stock for experimental use next year. The status of the caretaker has finally been settled until July 1 at least.

Wieslander, from the Lassen, will arrive on May 15 to begin work in Research. Wieslander's excellent work in timber sales administration, management plans, timber sale inventory methods, growth studies and his thorough forestry education makes certain that he will be a valuable acquisition for the new California Forest Experiment Station when it is organized this summer.

APPALACHIAN FOREST EXPERIMENT STATION

General

A thorough inspection of filing and accounting procedure at the Station was made during the month by O. A. Zimmerli of the Washington office. This being the first inspection of office routine the Station has had, Mr. Zimmerli's comments were very much appreciated. L. H. Reineke, of the Section of Computing, Washington office, also spent some time in Asheville, reviewing the data for several reports now under way.

A telephone was installed by McCarthy at the Bent Creek laboratory. This was connected with the Forest Service wire to the Bent Creek ranger station by building a quarter mile of line.

Bad fire weather prevailed during American Forest Week, and there were a number of rather serious blazes. One fire, plainly visible from the dining room of the Battery Park Hotel, Asheville, served to illustrate a talk on fire damage and fire protection given by McCarthy at a luncheon of the American Business Club, April 23.

Among the out-of-town visitors in April were W. R. Mattoon, of the Washington office; D. A. Crocker, Secretary-Forester of the Woodlands Section, American Paper and Pulp Association; R. W. Graeber, State Forest Extension Specialist for North Carolina; and John H. Davis, Assistant Professor of Botany, Davidson College.

Planting

Thirteen experimental plots were added to the 34 established in previous years in the spruce type burn in the Black Mountains, accessible by the Mount Mitchell Motor Road. Most of these are chain-square plots containing 100 seedlings or transplants each. The species put out for test this year were northern white cedar, Japanese larch, lodgepole pine, red pine, and "pedigreed" Scotch pine, contributed by the New York State College of Forestry, the Ohio Forest Service, and the Michigan National Forest. Transplants or seedlings of white fir, from the Monument Nursery (Pike National Forest, Colorado), of sugar maple and arborvitae, from the Cornell Forest School nursery, and of red pine from the Vermont State Forester and the Pennsylvania Department of Forests and Waters, arrived too late for the Mount Mitchell planting and were set out until next year in nursery rows at Bent Creek, along with the surplus from the Mount Mitchell work. Some of this material was planted in small plots at Bent Creek as the beginning of an arboretum. The work was done by Haasis, Frothingham, and Budd, with some additional assistance.

Through the cooperation of the North Carolina State Forester's office four of the experimental plots were this year set out in the State Park, on the crest of the Black Mountains. Lodgepole and Norway pine, Japanese larch, and northern white cedar are thus being tested at the highest altitudes and under different conditions than prevail in the other

experimental blocks. Assistant State Forester F. H. Claridge and State fire warden Simmons planted three of the plots. They also added to the State planting previously made by setting out 500 Norway spruce transplants supplied by Supervisor Mattoon.

Planting in the spruce type this year is more extensive than ever before. The Pisgah National Forest staff put in 86,000 Norway spruce transplants in the Black Mountain burns, while 200,000 were planted by the Champion Fibre Company on their lands in the Smoky Mountains.

Thirty-two plants of a Chinese chestnut, Castanea mollissima, obtained for the station by Mr. G. B. Sudworth, were set out at three points in the Bent Creek investigative area. The planting of Castanopsis delavayii, which was made last fall, has failed completely. Every one of the seedlings died, including many which had been heavily mulched under boxes. The bark was found to have split lengthwise of the stem and to have become separated from the wood.

Studies in Forest Entomology

Entomological work was begun during the month, the early warm and dry season advancing insect activity. Dr. Craighead and R. A. St. George cut and fitted part of a large "blimp" cover over the aridity sample plots which last year were tented with paraffined muslin. Two insect breeding cages were set up on concrete bases, hygrothermograph and precipitation records were started, and the two MacDougal dendrographs were again installed. Mr. A. D. Daughton, of Falls Church, Va., has joined the entomological staff as assistant.

Oak Germination Studies

Korstian is drawing his work at New Haven to a close with the preparation of his dissertation on the germination and early survival of several species of oak. Four days of field work were put in by Haasis and Budd at Bent Creek, making observations on the condition of the 10,000 acorns planted last fall with and without a cover of litter.

GRAZING RESEARCH

Washington

The examination for Junior Range Examiner required considerable time of the members of the Office during the month, but it is finally out of the way. Just what success the thirty-six "Hopefuls" have had will not be known until the Civil Service Commission finishes its part of the checking of the papers.

Mrs. V. A. Gassaway assumed her duties as Chief Clerk of the Office at the end of the month.

Visitors

Mr. W. G. McGinnies departed the latter part of the month for Missoula. The bulk of his time was devoted to the preparation of his report on the Range Management Investigations on the Madison National Forest.

Publications

The galley proof of Department Circular 379, "The Use of Salt in Range Management" by Chapline and Talbot was received and checked during the month.

The galley proof of Department Bulletin 1405 "Range Readiness and Forage Production on the National Forests" by Sampson and Malmsten formerly of the Great Basin Experiment Station was received from the Government Printing Office and sent to the authors for checking.

Jornada Range Reserve

Weather conditions during the month have continued mild, with hardly enough moisture to maintain the grass growth started in March. The weed crop, however, is good on types having sandy soil and materially better generally than usually occurs at this time of the year in this locality.

The complete establishment in the field of the new Black grama perio study was accomplished about the middle of the month including the initial charting of all quadrats and composition write-ups for the several enclosures and outside range. A new precipitation station was also established for this project. This study is composed of six one-acre enclosures which will be grazed at different periods during the year, together with outside range grazed year long, to determine more definitely the proper season of use for this type range in order to secure the highest productivity and to ascertain the factors which affect the maintenance of this type in this section of the Southwest.

On April 6, Mr. Waggoner and the Director spent the entire day looking over a good portion of the Mesa range and inspecting the fence construction involved in the rearrangement of pastures under the new management plan. This work is progressing in a very satisfactory manner.

An attractive sign which reads "Jornada Range Reserve - W. H. Waggoner, Cooperator - 10 miles to Headquarters" and is hung on an appropriate archway constructed of heavy timbers, has just been set up at the main entrance on the main road to the Reservation.

Mr. Klemmendson of the Bureau of Agricultural Economics spent considerable time in the Las Cruces Office this month, discussing and going over data which has to do with the Ranch - Livestock Survey being carried on in the Southwest by the B. A. E., B. A. I. and the Extension Service.

Santa Rita Range Reserve

Visitors

Mr. Cooperrider in charge of Grazing Research in District 3 spent several days on the Reserve during the latter part of March. The various projects under way here were taken up both in the field and office.

Messrs. Taylor of the Biological Survey and Pearson from the Southwestern Forest Experiment Station spent April 8 and 9 going over the Reserve and discussing the various projects. Mr. Pearson's remarks when he left indicate that his opinion of our "desert" country underwent a very radical change after seeing the growth of forage on the Santa Rita.

Mr. Ross, Director of Extension Work in Arizona, paid a brief visit to the Reserve during the month, and was very favorably impressed with forage growth conditions as well as the condition of the stock. He also looked over some of our protected plots on this trip.

Plant Identification

Approximately 70 plant specimens typical of the spring growth in this region have been collected during the past month and sent in to Washington for identification. Further collections are planned throughout the spring and it is hoped that we may reach our goal of at least 200 specimens before summer growth sets in.

Predatory Animals

A trio of wolves recently paid a visit to the Reserve and true to form left ample evidence of their visit in the shape of several head of dead calves. Upon request the Biological Survey immediately dispatched W. A. Knibbe, Government Trapper, to the scene. However, weather conditions were extremely unfavorable during his visit with the result that he was unable to catch any of them. He plans another trip soon.

Spring Forage Growth Conditions

With a total rainfall of 7.32 inches at Florida Station from January 1 to April 30 the prospects for an exceptional spring are good. The monthly distribution follows: January 2.09", February 1.19", March 2.36", and April 1.68". All these rains have been general over the entire Reserve though of course not as heavy as at the Station. The average for all the sixteen rainfall stations on the Reserve show the following records: January 1.33", February 0.98", March 1.92" and April (1.10" estimated). Under these conditions spring growth of weeds has been exceptionally good and even the perennial grasses have made an appreciable growth. Indian Wheat is to be found everywhere and Alfilaria has been noted in many places where it has never been found before and indicates a very appreciable spread as compared to previous years. The growth of poppies bids fair to rival that of 1919 and the upper portion of the Reserve is a virtual carpet of yellow which can be seen from a great distance off. Browse species started leafing out in the early part of April but were set back by a cold spell on the 9th and 10th. However, during the last ten days growth has started again with indications that another two weeks will see all species in full leaf.

Stock and Market Conditions

Stock on the Reserve are in excellent condition and far above normal for this season of the year. Stock on adjoining open ranges are from fair to good condition with a few outfits reporting their stock in excellent condition. Market conditions are decidedly better than a year ago and will likely be considerably better than in the spring of 1924. Practically all the stock in this region is already contracted for May delivery, yearlings going for $27 to $35 and twos and threes up to as high as $45.

Handling Stock

With the intention of securing additional bulls for the herds on the Reserve a trip was made to the Arizona Meat Company's ranch near Douglas, Arizona, on April 3. Messrs. Nicholson and Ruelas accompanied the Director on this trip and looked over the breeding herd and young bulls. All the registered cows in this herd are range-bred and are an exceptionally good bunch of cows. The herd sire is a polled Hereford and while very good as polled stock go is considerably under the average horned bull in the same price class. The young bulls showed the polled characteristics with a tendency toward weakness in the flank and hind quarters. Due to these characteristics our cooperators did not purchase any of them for use on the Reserve.

GREAT BASIN EXPERIMENT STATION

Mr. Forsling spent a few days the middle of the month at the Sheep Experiment Station at Dubois to check spring growth in connection with the spring-fall range investigations which he is handling there. Range conditions in that part of Idaho are excellent at this time. The warm weather during the past two weeks has started the forage in excellent shape. The prospects for later in the season are not so good, however. The snow has receded much farther up the mountain slopes than is usual for this time of year as the result of the warm weather. If this continues and rain or snow does not occur in the next few weeks, there is danger of vegetation drying up which will result in an early fire season and poor forage growth late in the spring.

Mr. Nelson left Ogden the middle of the month to start field work at the Station.

DISTRICT 3

Mr. R. F. Copple was transferred by the District from his former assignment as administrative grazing assistant on the Apache Forest to the District Office as an addition to the staff of range research. Mr. Copple joined Cooperrider at Roosevelt Dam April first, where Cooperrider has been making Roosevelt temporary headquarters; the going range research projects for the District being conducted on the watershed, brush forests.

The carrying capacity pasture on the Gila Forest was examined during April. A range reconnaissance of present cover was made, a number of permanent photographic stations were established and a few quadrats located to better determine whether gulley washing is progressive or healing under present stocking. Erosion bids fair to be the most important influence for consideration in dealing with this pasture which is characteristic of large areas of forest, State and public lands.

Exceptional precipitation accompanied by warm, cloudy periods have made possible and necessary the devoting of considerable time to a study of the vegetation and influences on and by erosion peculiar to the semi-desert region surrounding Roosevelt Dam. Plant collecting has been carried on rather extensively in connection with vegetation study since annuals that have occurred but sparsely for a number of years are abundant and perennials are exceptionally fit for study. The season, the unusual vegetation cover and the large area of exposed silted lake bed have created/an exceptionally interesting combination for observation.

The period April 19 to 29 was spent in cooperation with Director Pearson of the Southwestern Forest Experiment Station in an examination of the smelter smoke damage area in the Clarkdale-Jerome District of the Verde Valley. The smoke damage proposition has again arisen through the question of land exchange., The forest value of the area immediately concerned is largely one determined by the possibility of securing or maintaining an adequate grass cover to protect the watershed, valuable in whole for agricultural dependency, in part for power, for municipal waters and highly developed industry.

DISTRICT 6

The first two weeks of April were spent in check and analysis of the seedling damage recheck data (grazing management of cut-over areas study) secured on the Columbia Forest during the latter part of March.

The balance of the time during this period was spent on preparation of 1924 and 1925 plant collections for submission to the Forester for identification.

April 19-24 was spent on the Cascade assisting the Supervisor and Rangers in laying out minor studies work on the projects "Seasons of grazing" and "Deferred use of Mt. Meadows." A total of 10 plots on 4 sheep ranges will be studied on the Cascade and a plant development record will be made of the vegetation at three stated periods during the summer. The Supervisor and Rangers have taken a keen interest in the development of details in connection with these minor range investigations.

The second trip to the Columbia Forest and the completion of the spring reproduction damage recheck work in the grazing management of cut-over areas study was made the last of April. Complete analysis for the entire transect will now be completed.

The compilation made of the Columbia cut-over data for the first 34 chains (which transected the area most heavily grazed) is of interest.

This compilation shows that a total of 139 seedlings of all ages and species ~~was~~ were recorded in 1925 on the checked portion up to the 64th chain. Sixty-nine of these seedlings (approximately 50%) were found living, thrifty and uninjured. Twenty-eight seedlings or 20% were found dead, mainly in undisturbed duff, rotten wood, etc., and were quite evidently natural losses. Several of these had been reported as sickly prior to grazing use.

Forty-two or 30% were entirely missing. These occurred mainly in the open where soil disturbance was evident. In addition 12 living seedlings not previously recorded were found and recorded.

It was found impossible to determine exactly the proportion of the 30% loss which should properly be charged to grazing use. It is conceivable, however, that a certain number of the 1924 and 1925 germination not found died from natural causes (i. e., from causes other than grazing use).

This conclusion is confirmed by comparative check on protected areas within enclosures No. 1 on chain 2 and No. 5 on chain 30-31 where 7 or 35% of the original 20 seedlings reported as thrifty in 1925 were entirely missing in the recheck.

Reviewing the data it is significant that the loss of the seedlings is preponderantly of the younger (1924-25) age classes, assumedly prior to permanent establishment, which agrees with the suggestion that grazing would best be deferred after logging for two to three years.

1920 1923

While some injury to seedlings of ~~1923~~ to ~~1928~~ vintage is recorded this occurred usually where extreme overgrazing and trampling resulted along skidways, bedgrounds and the like. Anything approaching normal grazing use did not appear to seriously affect seedlings of this age.

It will be noted that twelve 1925 seedlings not previously recorded were found. Several of these doubtless were missed at the time of the original check, the balance doubtless germinated late and withstood the summer drought and escaped natural loss, injury from grazing and other causes.

From the observations made it seems clear that damage due to grazing of any importance was in 1925 mainly by trampling and bedground conditions which endangered and sometimes eliminated the one and two year old seedlings prior to final establishment. This appears to be of vastly greater importance than the nipping and actual grazing damage. On bedgrounds where little else is available lambs and even the ewes were found to sometimes nibble the older seedlings, though when actually grazing and moving over the range the abundant browse and variety of feed seem to satisfy the craving for variety in the diet.

The scarcity of seedlings along this transect will no doubt impress the reader. It should be remembered, however, that most of this cut-over area has been burned two or more times. The site is peculiarly hot and dry and last year's survival was below normal. On a similar area adjacent planted with 1.1 stock last spring and protected from grazing use 40% losses occurred. Another area - no grazing use - on the Snoqualmie survival was even less favorable than on the Columbia area where the heaviest grazing occurred. Results where only moderate use occurred will be reported next month and should show some interesting comparisons.

Comparison of growth development of a number of herbaceous species which occur on the Columbia cut-over range now and at the same time last year indicatesthe 1926 season to be over three weeks in advance of 1925. The latter was considered rather an early one. Plant development data secured so far seems to indicate a probable range of six to seven weeks difference between extremely early and late seasons in this region. This is mainly important in indicating the difficulties experienced by administrative officers in making adjustments in seasonal use and numbers and the necessity for allowing some margin to work from.

Plans are being perfected this summer to weigh the lambs upon entering and leaving the cut-over area to determine the gains made. Small grass strip seeding tests were initiated in March also on the Columbia cut-over area and may be expanded by the addition of fall seeding tests.

Thos. P. MacKenzie of the British Columbia Dept. of Lands (formerly Assistant District Forester in Grazing in this District) was an office visitor the latter part of March. Mr. MacKenzie has expressed considerable interest in the grazing management of cut-over lands study and has promised us another visit in May or June when he can see the sheep actually using the range. A similar problem of grazing use as a means of reducing fire hazard on cut-over areas he states confronts the private operator in British Columbia.

RS Manuscript Reports Received

District 5

Methods of Cutting on the Tahoe National Forest (Progress Report).

District 8

Yield Studies for Even-Aged Spruce Stands on the Tongass National Forest (Office report).

Northeastern

Notes on Damage to Advance Spruce and Fir Reproduction through Logging. M. Westveld (Jour. For.)

Southern

An Aid in Establishing Sand Flat Tests. P. C. Wakeley and R. A. Chapman (Jour. For.)

Appalachian

An Analysis of Fire Damage in Appalachian Forest. E. F. McCarthy (For Jour. For.)

Weather and Forest Inflammability in the Southern Appalachians. E. F. McCarthy (For. J.A.R.)

Lake States

Handbook of Forest Planting in the Lake States. J. Kittredge, Jr. (Dept. Bull.)

Pacific Northwest

Relative Humidity and Static. A. G. Simson. (Progress Report)

Research and the Forest-Fire Fighter. A. G. Simson.

Nature's Role in Reforestation. R. H. Westveld.

Research Program for 1926. T. T. Munger.

Artificial Tests of Douglas Fir Seed Dissemination	Leo A. Isaac
Douglas Fir Seed Storage in the Duff	
Number, Size and Condition of Snags after Logging in the Douglas Fir Region	
Natural Germination and Survival of Douglas Fir on West Fir Plots	
Spacing in Douglas Fir Plantations	
A Survey of Natural Reproduction on Cut-over Lands in the Douglas Fir Region of Oregon	

New Yield Tables for Douglas Fir. R. E. McArdle.

Northern Rocky Mountain

Organization of the Forest Service in Finland. (Digest from Proceedings of Finnish Forest Excursion of June 26-30, 1925). R. H. Weidman.

Washington

Notes on the Survival and Growth of Trees Planted in Rock Creek Arboretum, Washington, D. C. R. M. Brown.

In Print

Munger, T. T. Forest Research Program for 1926. (West Coast Lumberman, April 15, 1926 and Timberman, April, 1926).

Westveld, R. H. Slash Disposal, Its Role in Yellow Pine Region. (Timberman, April, 1926).

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